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The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Previously Presented) A DC connector, comprising:
an outer shell; and
an inner electrode disposed within the outer shell, the inner electrode having redundant power contacts electrically isolated within the same plane, the redundant power contacts being laterally spaced apart equally relative to a central axis, the outer shell and inner electrode being configured for 0/180 degree connection with a second outer shell and second inner electrode of a second DC connector along a mating axis, the outer shell and inner electrode of the DC connector having an axial contact distance with the second outer shell and second inner electrode of the second DC connector of less than 5 mm when fully mated so as to minimize the mating force between the DC connectors, and to allow angled insertion and extraction away from the mating axis during the 0/180 connection with the second DC connector.
2. (Cancelled)
3. (Cancelled)
4. (Previously Presented) The DC connector as recited in claim 1 wherein the axial contact distance is between about 3 and about 4 mm.
5. (Previously Presented) The DC connector as recited in claim 1 wherein the axial contact distance is achieved without using locking mechanisms.
6. (Previously Presented) The DC connector as recited in claim 1 wherein the axial contact distance is achieved with a retention mechanism found between the first and second DC connectors.
7. (Currently Amended) A DC connector arrangement having a signal line, a first power line, and a second power line, the DC connector arrangement comprising:
a DC receptacle comprising:
an outer conductor; and

an inner electrode disposed within the outer conductor;
a DC plug for insertion into the DC receptacle at only 0 and 180 degrees, the DC plug comprising:
an outer conductor that electrically mates with the outer conductor of the DC receptacle in both the 0 and 180 degree orientations; and
an inner electrode disposed within the outer conductor and that electrically mates with the inner electrode of the DC receptacle in both the 0 and 180 degree orientations,
wherein the inner electrodes of both the DC plug and DC receptacle include juxtaposed contacts, the juxtaposed contacts including a single center signal contact and first and second lateral redundant power contacts that are equally spaced from the center signal contact and positioned in their entirety on opposing sides of the center signal contact, the center signal contacts being configured to transmit data signals, the first and second lateral redundant power contacts being configured to transmit DC power, and
wherein the center signal contact of the DC plug mates with the center signal contact of the DC receptacle in both the 0 and 180 degree orientations in order to establish the only signal line of the DC connector arrangement, and
wherein the first lateral redundant power contact of the inner electrode of the DC plug mates with the first lateral redundant power contact of the inner electrode of the DC receptacle and the second lateral redundant power contact of the inner electrode of the DC plug mates with the second lateral redundant power contact of the inner electrode of the DC receptacle in the 0 degree orientation in order to establish the first power line of the DC connector arrangement, and
wherein the first lateral redundant power contact of the inner electrode of the DC plug mates with the second lateral redundant power contact of the inner electrode of the DC receptacle and the second lateral redundant power contact of the inner electrode of the DC plug mates with the first lateral redundant power contact of the inner electrode of the DC receptacle in the 180 degree orientation in order to establish the first power line of the DC connector arrangement, and
wherein the outer shell of the DC plug mates with the outer shell of the DC receptacle in both the 0 and 180 degree orientations in order to establish the second power line of the DC connector arrangement.

8. (Original) The DC connector arrangement as recited in claim 7 wherein each of the contacts includes an upper contact surface and a lower contact surface.

9. (Original) The DC connector arrangement as recited in claim 7 wherein the outer conductive shell of the DC plug fits into the outer conductive shell of the DC receptacle, and wherein the inner electrode of the DC receptacle fits into the inner electrode of the DC plug.
10. (Cancelled)
11. (Cancelled)
12. (Previously Presented) The DC connector arrangement as recited in claim 7 wherein the inner electrode of the DC receptacle includes an insulator, the insulator including a plurality of grooves within which the center and lateral contacts reside and wherein the inner electrode of the DC plug includes an insulator, the insulator including a plurality of rails containing the center and lateral contacts, the rails of the DC plug sliding in and mating with the corresponding grooves of the DC receptacle when the DC plug is mated with the DC receptacle so that the center and lateral contacts of the DC plug electrically engage the center and lateral contacts of the DC receptacle.
13. (Previously Presented) The DC connector arrangement as recited in claim 12 wherein each of the juxtaposed contacts includes an upper contact and a lower contact that are electrically connected in order to form one of the contacts of the juxtaposed contacts and wherein the insulator of the DC receptacle includes an upper groove for each of the upper contacts and a lower groove for each of the lower contacts, and wherein the insulator of the DC plug includes an upper rail for each of the upper contacts and a lower rail for each of the lower contacts.
14. (Original) The DC connector arrangement as recited in claim 7 wherein the outer conductive shell of the DC receptacle includes a holding flexure, and wherein the outer conductive shell of the DC plug includes a recess for receiving a detent of the holding flexure in order to help secure the DC plug to the DC receptacle
15. (Original) The DC connector arrangement as recited in claim 7 wherein the outer conductive shell of the DC receptacle includes one or more ground flexures for making electrical contact with the outer conductive shell of the DC plug.

16. (Currently Amended) A DC connector arrangement comprising:
a DC receptacle having an outer shell and an inner electrode disposed within the outer shell;
a DC plug insertable into the DC receptacle, the DC plug having an outer shell that mates with the outer shell of the DC receptacle and an inner electrode that mates with the inner electrode of the DC receptacle, the outer shells forming a first power line of the DC connector arrangement when mated, the inner electrodes forming a second power line of the DC connector arrangement when mated;
a holding detent mechanism located between the DC receptacle and DC plug, the holding detent mechanism minimizing the distance the plug has to travel relative to the receptacle at the friction force required to hold the plug in the receptacle during normal use; and
one or more contact flexures for ensuring electrical contact between the DC receptacle and the DC plug.
17. (Previously Presented) The DC connector arrangement as recited in claim 16 wherein the holding detent mechanism includes a plug side feature and a receptacle feature that are cooperatively positioned so that when the DC plug is inserted into the DC receptacle, the features engage thus securing the DC plug to the DC receptacle.
18. (Original) The DC connector arrangement as recited in claim 17 wherein the DC receptacle includes one or more holding flexures, each of the holding flexures including a detent that springs into a corresponding recess of the DC plug.
19. (Original) The DC connector arrangement as recited in claim 16 wherein the holding detent mechanism provides enough holding power to maintain the proper placement of the DC plug within the DC receptacle while still allowing a user to overcome it when inserting and extracting the DC plug to and from the DC receptacle.
20. (Cancelled)
21. (Original) A DC connector assembly, comprising:
a DC receptacle including a receiving element; and
a DC plug including an insertion element that both mechanically and electrically couples to and decouples from the receiving element, the coupling between the insertion element and

receiving element allowing DC power transmissions to occur between the DC plug and the DC receptacle, the insertion element being configured for only 0/180 degree insertion into the receiving element while providing the same functionality from both positions, the insertion and receiving elements having a small axial contact distance between about 3 and about 4 mm in order to minimize the insertion extraction force found between the insertion and receiving elements; and

wherein the receiving element includes a plurality of contacts that coincide exactly with a plurality of contacts located on the insertion element, at least a portion of the corresponding contacts being power contacts for allowing DC power transmission to occur between the DC receptacle and DC plug.

22. (Previously Presented) The DC connector as recited in claim 1 wherein the height of the DC connector is smaller than the width of the DC connector.

23. (Currently Amended) The DC connector arrangement as recited in claim 7 wherein the center signal contacts ~~[[is]]~~ are configured to transmit an identification ~~[[data]]~~ signal associated with determining the DC requirement of an electronic device, wherein the redundant power contacts are configured to transmit a driving current, and wherein the outer conductors are configured to transmit a return current.

24. (Currently Amended) A DC connector arrangement, comprising:

a DC receptacle comprising:

an outer conductor ~~The DC connector as recited in claim 7 wherein the outer conductor of the DC receptacle is~~ formed from two conductive layers, and wherein the seams for each layer are placed in an opposed relationship to provide greater rigidity to the outer conductor; and

an inner electrode disposed within the outer conductor

a DC plug for insertion into the DC receptacle at only 0 and 180 degrees, the DC plug comprising:

an outer conductor that electrically mates with the outer conductor of the DC receptacle in both the 0 and 180 degree orientations; and

an inner electrode disposed within the outer conductor and that electrically mates with the inner electrode of the DC receptacle in both the 0 and 180 degree orientations.

wherein the inner electrodes of both the DC plug and DC receptacle include juxtaposed contacts, the juxtaposed contacts including a center contact and first and second lateral redundant contacts that are equally spaced from the center contact and positioned in their entirety on opposing sides of the center contact, the center contacts being configured to transmit data signals, the first and second lateral redundant contacts being configured to transmit DC power, and

wherein the center contact of the DC plug mates with the center contact of the DC receptacle in both the 0 and 180 degree orientations, and

wherein the first lateral redundant contact of the inner electrode of the DC plug mates with the first lateral redundant contact[s] of the inner electrode of the DC receptacle and the second lateral redundant contact of the inner electrode of the DC plug mates with the second lateral redundant contact of the inner electrode of the DC receptacle in the 0 degree orientation, and

wherein the first lateral redundant contact of the inner electrode of the DC plug mates with the second lateral redundant contact of the inner electrode of the DC receptacle and the second lateral redundant contact of the inner electrode of the DC plug mates with the first lateral redundant contact of the inner electrode of the DC receptacle in the 180 degree orientation

25. (Previously Presented) The DC connector arrangement as recited in claim 15 wherein the outer conductive shell of the DC receptacle includes a pair ground flexures at the top of the outer conductive shell and a pair of ground flexures at the bottom of the outer conductive shell.

26. (Previously Presented) The DC connector arrangement as recited in claim 16 wherein the holding detent mechanism includes a pair of holding flexures in an opposed relationship on the sides of the DC receptacle and a pair of recesses in an opposed relationship on the sides of the DC plug, the holding flexures having detents that are configured to spring into the recesses when the DC plug is mated with the DC receptacle in order to help secure the DC plug to the DC receptacle, and wherein the DC receptacle includes a first pair of contact flexures on the top of the DC receptacle and a second pair of contact flexures on the bottom of the DC receptacle, the first and second pairs of contact flexures being in opposed relationship.

27. (Currently Amended) The DC connector arrangement as recited in claim 16 wherein the DC receptacle comprises:

~~an outer conductor; and~~

~~an inner electrode disposed within the outer conductor,~~
~~and wherein the DC plug comprises:~~
~~an outer conductor that electrically mates with the outer conductor of the DC~~
~~receptacle; and~~
~~an inner electrode disposed within the outer conductor and that electrically mates~~
~~with the inner electrode of the DC receptacle;~~
and wherein the inner electrodes of both the DC plug and DC receptacle include
juxtaposed contacts, the juxtaposed contacts including a center contact and lateral redundant
contacts that are equally spaced from the center contact, the center contact of the DC plug being
configured to mate with the center contact of the DC receptacle, the lateral redundant contacts of
the DC plug being configured to mate with either of the lateral redundant contacts of the inner
electrode of the DC receptacle, the lateral redundant contacts of the DC receptacle and DC plug
providing the same functionality such that the DC connector arrangement is operational in
multiple orientations.

28. (Previously Presented) The DC connector arrangement as recited in claim 14 wherein the
outer conductive shell of the DC receptacle includes a pair of holding flexures in an opposed
relationship on the sides of the outer conductive shell of the DC receptacle, and wherein the
outer conductive shell of the DC plug a pair of recesses in an opposed relationship on the sides of
the outer conductive shell of the DC plug, the holding flexures having detents that are configured
to spring into the recesses when the DC plug is mated with the DC receptacle in order to help
secure the DC plug to the DC receptacle.

29. (Previously Presented) The DC connector arrangement as recited in claim 23 wherein the
DC receptacle is coupled to an electronic device, and wherein the DC plug is coupled to a power
adapter configured to receive AC power and output DC power for transmission through the DC
plug, the power adapter including a power converter that converts the source AC power into DC
power required for operating or charging the electronic device, the power converter including an
identification circuit that communicates with the electronic device through the center contact in
order to determine the DC requirement of the electronic device.

30. (Previously Presented) The DC connector arrangement as recited in claim 12 wherein the
contacts of the DC receptacle are coupled to a PCB via wires embedded in the insulating

member, and the outer conductor of the DC receptacle is coupled to the PCB via legs or posts that extend out the bottom of the outer conductive shell.

31. (New) The DC connector as recited in claim 1 wherein the axial contact distance is achieved at least in part by placing an end of the redundant power contacts at a mating end of the inner electrode.
32. (New) The DC connector as recited in claim 1 wherein the outer shell is configured for a first power line of the DC connector and the redundant power contacts are configured for a second power line of the DC connector, the outer shells electrically mating with one another at 0 and 180 degrees in order to establish a first power line therethrough, the redundant power contacts of the inner electrodes electrically mating with one another at 0 and 180 degrees in order to establish a second power line therethrough.
33. (New) The DC connector as recited in claim 1 wherein the same functionality is provided by the connector when the outer shells and inner electrodes are connected at 0 degrees and 180 degrees.
34. (New) The DC connector arrangement as recited in claim 12 wherein the ends of the center and lateral contacts extend to the ends of the grooves at a mating end of the inner electrode of the DC receptacle, and wherein the ends of the center and lateral contacts extend to the ends of the rails at the mating end of the rails of the inner electrode of the DC plug.
35. (New) The DC connector arrangement of claim 16 wherein an outer perimeter of the outer shell of the DC plug is dimensioned to coincide with an inner perimeter of the outer shell of the DC receptacle, and wherein an outer perimeter of the inner electrode of the DC receptacle is dimensioned to coincide with an inner perimeter of the inner electrode of the DC plug.
36. (New) The DC connector arrangement of claim 16 wherein the outer shells are formed from an electrically conductive material, a receiving end of the inner electrode of the DC receptacle is spatially separated from the inside surface of the outer shell of the DC receptacle thereby forming a void between the outer shell and the inner electrode of the DC receptacle, the receiving end of the inner electrode of the DC receptacle comprising an insulator body and plurality of juxtaposed conductive contacts on the outside of the insulator body, the inner

electrode of the DC plug comprising an insulator body and a plurality of juxtaposed conductive contacts disposed on an inside surface of an opening of the insulator body, the insulator body of the DC receptacle fitting within the opening of the insulator body of the DC plug so that the conductive contacts can engage one another thereby forming the second power line of the DC connector arrangement, the outer shell and insulator body of the DC plug fitting within the void found between the outer shell and the inner electrode of the DC receptacle so that the outer shells can engage one another thereby forming the first power line of the DC connector arrangement.

37. (New) The DC connector arrangement as recited in claim 16 wherein the DC plug is insertable at two positions while maintaining the first and second power lines of the DC connector arrangement.
38. (New) A low profile DC connector dedicated to transmitting DC power to a high powered electronic device, the low profile connector being configured for only 0/180 engagement while providing the same DC power transmissions from both positions, the low profile DC connector including a planar inner electrode and a conductive outer shell surrounding the periphery of the planar inner electrode, the planar inner electrode having redundant power contacts positioned on opposite sides and at equal distances from a central axis of the inner electrode, the redundant contacts forming a driving line for the low profile DC connector, the conductive outer shell having an annular shape with width greater than a height, the outer conductive shell forming a return line for the low profile DC connector.
39. (New) The low profile DC connector as recited in claim 38 wherein the high powered electronic device is a laptop computer.
40. (New) The low profile DC connector as recited in claim 38 wherein the redundant contacts are configured to transmit a voltage greater than 12 volts.
41. (New) The low profile DC connector as recited in claim 38 wherein the redundant contacts are configured to transmit a voltage of about 24.5 volts.

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